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Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

SEP 10 1997

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of	)	
	)	
Federal-State Joint Board on	)	CC Docket 96-45
Universal Service	)	
	)	
Forward-Looking Mechanism	)	
for High Cost Support for	)	CC Docket 97-160
Non-Rural LECs.	)	

JOINT COMMENTS OF BELL SOUTH CORPORATION, BELL SOUTH  
TELECOMMUNICATIONS, INC., US WEST, INC., AND SPRINT LOCAL TELEPHONE  
COMPANIES REGARDING THE SEPTEMBER 3, 1997 WORKSHOP

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I. INTRODUCTION

The BCPM Joint Sponsors (Sprint Local Companies, US WEST and BellSouth) initially, takes this opportunity to thank Dr. Mark Kennet and the FCC Staff for their valuable input in the development of the proposed customer location algorithm presented during the September 3, 1997 workshop. The Joint Sponsors recognize that the proxy models can benefit from improvements and that, as is often the case, the best way to reach the next higher level of accuracy in modeling is to take advantage of a fresh perspective. The Joint Sponsors assert they have done just that in recent improvements in the BCPM and further, are encouraged that the FCC Staff has independently developed a customer location approach similar to that used in the enhanced BCPM.

II. COMMENTS

It is a fact that the successful identification of where customers truly reside is critical to the successful and accurate determination of cost of Universal service and the resulting subsidy. As the Joint Sponsors stated in their September 2, 1997 comments on customer location data, the proper determination of the location of customers in the previous models

has been deficient, primarily in the area where the models need to be most accurate: the rural area. Dr. Kennet's proposal<sup>1</sup> recognizes this fact and thus employs a variable-sized gridding process and customer data at the Census Block (CB) level to locate customers, rather than using the Census Block Group (CBG) approach relied upon by the Hatfield model and earlier versions of BCPM.

In recognition of the noted deficiencies of using the CBG as the modeling unit, the Joint Sponsors are implementing improvements in BCPM to work around a new modeling unit known as the "dynamic" grid. The Joint Sponsors' grid approach, as outlined in our September 2, 1997 comments, is strikingly similar to the grid approach recommended by Dr. Kennet. In fact, the Joint Sponsors gleaned a good deal of useful information from another workshop presented by Dr. Kennet several months ago. The process proposed by the Joint Sponsors is consistent with and incorporates a number of the key concepts of Dr. Kennet's proposal.

While the "grid" concept may not be a new entity in the proxy arena<sup>2</sup>, its application to the proposals currently before the Joint Board staff provides significant improvements in the development of the customer location algorithm within the proxy models. The Joint Sponsors submit that our approach to this issue and that proffered by Dr. Kennet are very similar. However, we believe that we have taken the best of the his ideas and combined them with other improvements to create a superior customer location process. Namely, BCPM now includes road footage in the decision matrix; outside plant engineering design concepts that use the grid entity; a computer code that works well in a "production mode"; and actual state runs of the customer location algorithm that can be viewed, tested, and used as input to the proxy models.

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<sup>1</sup> Our review of Dr. Kennet's proposed gridding process is limited to the information proffered at the September 3, 1997 workshop. Consequently, any misrepresentations of that proposal contained herein are unintentional.

<sup>2</sup> The Cost Proxy Model, a predecessor to the BCPM, used a grid as the basic level of input.

The following table contains a comparison of the Dr. Kennet's and BCPM customer location algorithms, as well as a further comparison of these methodologies to the approach which has been described by the Hatfield sponsors in their September 2, 1997 Comments and September 3, 1997 ex-parte presentation. This table details the numerous points on which the FCC Staff's proposal and BCPM are in agreement. Where the methods are not consistent, the Joint Sponsors submit that they have taken the concepts developed by Dr. Kennet, improved upon them, and put them into production.

<b>Customer Location Item</b>	<b>FCC Proposal</b>	<b>BCPM Proposal</b>	<b>Hatfield Proposal</b>
<b>Source of Data</b>	Census Bureau	Census Bureau	Mailing Lists
<b>Level of Data</b>	Census Block	Census Block	Geocoded to Points, CB, CBGs, Ctracts
<b>% of Households Captured</b>	100%	100%	Unknown
<b>Geographic Entity used in Model</b>	Consistent Grid	Flexible Consistent Grid incorporating engineering criteria that accounts for customer clusters where they actually exist	Cluster of some sort
<b>Method to assign Households to Geographic Entity</b>	All households in Census Block assigned to Grid the CB centroid falls in	Households are partitioned to Grids based on road network dispersion within Census Block	Geocoding of Households. Proprietary clustering algorithm. 44% accuracy in rural areas.
<b>Max Size of geographic Entity</b>	18,000ft by 18,000ft grid	12,000 ft by 14,000ft grid (can be adjusted outside of model)	Cluster and Super Clusters. No stated maximum size

<b>Customer Location Item</b>	<b>FCC Proposal</b>	<b>BCPM Proposal</b>	<b>Hatfield Proposal</b>
<b>Minimum Size of geographic Entity</b>	Unknown	1,500ft by 1,700ft grid	Cluster and Super Cluster. No stated minimum size
<b>Method of Determining Grid Size</b>	If Count of lines exceeds set amount, grid is subdivided into quarters. Process is repeated up to 4 times	If Count of lines exceeds set amount, grid is subdivided into quarters. Process is repeated up to 3 times	Proprietary Algorithm
<b>Logic to Limit creation of Uneconomic Grids</b>	Unknown	Yes, Partial grids and ultimate grids with Line counts under 100 are re-aggregated with adjacent grids	Not applicable
<b>Assignment of Geographic entity to Wire Center</b>	Closest Wire Center	Serving Wire Center defined by BLR	Information not provided
<b>Distribution Engineering</b>	Still under development.  Only known item is that there may be multiple FDIs within a grid if line count limits exceeded.	Grid is Carrier Serving Area. Quadrants within the Grid considered possible distribution areas. Existence and Size of Distribution area based on actual road and household data in quadrant. Number of Feeder Distribution Interfaces is dependent on number of lines.	Still under development. Phase 1 will be some sort of Cluster with Road Cables. Phase 2 is unknown
<b>Feeder Engineering</b>	Still under development	Up to 4 feeders. Main feeders go straight for 10,000ft. They then will either split or not but will be pointed to population areas.	4 Feeders. Follow straight East, North, West, and South routes.

<b>Customer Location Item</b>	<b>FCC Proposal</b>	<b>BCPM Proposal</b>	<b>Hatfield Proposal</b>
<b>Sub-feeder Engineering</b>	Still under development	Sub-feeder will emanate from Main feeder. Will be shared along common routes to geographic entity.	Sub-feeder to each Geographic Entity. No sharing.
<b>DLC Placement</b>	Unknown	Road Centroid of Grid	Unknown
<b>FDI Placement</b>	Multiple in Grid	Multiple in Grid	Unknown
<b>Geographic Entity creation Process Tested</b>	Still under development	Yes, two states have been run	Still under development.
<b>Geographic Entity creation process in Production mode</b>	No. US West Montana Territory takes 3 days. Does not create Feeder routes	Yes, New Jersey and Colorado have been completed. Development code is being re-written in C++/Mapinfo code. State run currently < 48 hours.	Phase 1 data will be available in 3 weeks for a few wire centers. No known plan to run for other states until given a buy in.
<b>Business Data</b>	BCPM1.1 CBG level	PNR Census block (~85%) and , CBG &and Census Tract (~15%) data apportioned to Grids	Unknown
<b>Terrain Data</b>	BCPM1.1 CBG level	Grid Level	Unknown

It is important to note that the Joint Sponsors are not suggesting that the use of census data and grids is the ideal unit for the proxy model. Rather, we are saying that the census block data, partitioned into the grid, is the most accurate and realistic approach that is available at this time. In addition, however the customer is identified (geocoding, census data, etc.), an engineer does not model on a customer-by-customer basis. Rather, an outside plant engineer designs for a group of customers. This grouping is defined by engineering

constraints and economic efficiencies, and we believe the grid employed by BCPM defines this grouping in a simplified, consistent, and correct manner.

In initially researching the best way to determine the proper location of customers, the Joint Sponsors researched the prospects for geocoding customer locations. However, it soon became clear (as the Hatfield team has demonstrated) that there were many hurdles to overcome in this effort. The first challenge pertains to the source and quality of the customer database. For example, if one were to use a white page listing database, the errors in identifying all customers would be numerous considering the existence of non-published numbers and rural address identification. On the other hand, if a mailing list were used, what certainty is there that such a list contains all houses and that it accurately identifies addresses - especially if post office box numbers are used? It would seem that the best source of customer location information would be the actual ILEC customer service address databases. However, these databases are proprietary and thus it would be difficult to assume that access to such databases could be obtained universally.

Secondly, even assuming an accurate customer database can be located, geocoding software is not able to locate all customers to an exact latitude and longitude. The software fails most frequently in areas where accuracy is most needed: the rural area. In these rural areas, many addresses are listed as rural routes or post office boxes; and the software package will thus assign these types of addresses to higher geographic units than a point (typically the census tract). Even the Hatfield team has stated that geocoding of rural customers is only obtainable for a maximum of 44% of the households based on their mailing list database. This necessarily implies that more than 56% of the households could not be successfully geocoded.

Based on the fact that geocoded data currently provides a biased view of customer location, the Joint Sponsors have determined that the Census is still the best public source of information regarding household locations. Given this, the Joint Sponsors assert that the dynamic grid/census block process adapted in the BCPM offers the best method to initialize the new explicit support mechanism for non-rural LECs beginning in 1999.

### **III. CONCLUSION**

Dr. Kennet and the Joint Sponsors independently concur in some fundamental tenets regarding the customer location algorithms. The Joint Sponsors have built upon these tenets and have generated a model that can be executed in a time frame consistent with the FCC's objectives for Universal Service implementation. For the reasons elaborated upon above, the Joint Sponsors recommend that the customer location and network design algorithms they propose be adopted by the Commission.

Respectfully submitted,

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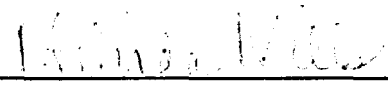
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## CERTIFICATE OF SERVICE

I, Melinda L. Mills, hereby certify that I have on this 10<sup>th</sup> day of September, 1997, served via U.S. First Class Mail, postage prepaid, or Hand Delivery, a copy of the foregoing "Joint Comments of BellSouth Corporation, BellSouth Telecommunications, Inc., US West, Inc., and Sprint Local Telephone Companies regarding the September 3, 1997 Workshop" in the Matter of Federal-State Joint Board on Universal Service, CC Docket No. 96-45, and Forward-Looking Mechanism for High Cost Support for Non-Rural LECs, CC Docket No. 97-160, filed this date with the Acting Secretary, Federal Communications Commission, to the persons on the attached service list.

  
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